Validation of the Plateletworks® Point of Care Platelet Function Analyzer

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Introduction: Potent GPIIb/IIIa inhibitors are administered to patients having percutaneous transluminal coronary angioplasty (PTCA). Plasma concentrations of 4.0μg/mL abciximab, 0.5μg/mL eptifibatide and 0.2μg/mL tirofiban are thought to provide clinically effective platelet inhibition.[1,2] Large variability, however, in the effect of the drugs has been documented and the patients have developed devastating bleeding complications from excess anticoagulation therapy.[3] The Plateletworks™ (Array Medical, Somerville, NJ) is an automated point of care function test based on a coulter counter and the platelet count ratio.[4]

Methods: Following IRB approval and informed consent, eight healthy adult volunteers had 40 cc of blood drawn and fractionated for experimentation. Ex-vivo additions of tirofiban, abciximab and eptifibatide, at ½ clinical concentration, clinical concentration and twice clinical concentration were conducted. Samples were then analyzed using ADP stimulated Plateletworks™ and 20μM ADP-PRP aggregometry. Spearman linear correlation was used. A p-value 0.05 was considered significant.

Results: The maximum aggregation from 20μM ADP aggregometry were cross-analyzed with the Plateletworks™ platelet count ratios. Tirofiban had an $r^2 = 0.83$ ($p=<0.001$). Eptifibatide had an $r^2 = 0.77$ ($p=<0.001$). Abciximab had an $r^2 = 0.62$ ($p= <0.003$).

Discussion: In this ex-vivo addition trial of the Plateletworks™ point of care platelet function analyzer, strong positive correlations were demonstrated when using all GPIIb/IIIa inhibitors. This leads to the conclusion that the device is an accurate measure of platelet function, and may be an effective device to guide drug administrations and may be useful in the operating room to assess platelet function.

References

1. Clinical Therapeutics 1992; 21(1): 128-37.
2. The Annals of Pharmacology 1996; 30(3): 251-7.
3. Circulation 1997; 96: 3828-32.
4. J Thrombosis and Haemostasis 1993; 69: 706.

ABSTRACT FROM
ANESTHESIA AND ANALGESIA 2000
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